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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/200,523

11/25/1998

SYED AON MUJTABA

4927

7590

06/02/2005

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EXAMINER

ELALLAM, AHMED

ART UNIT

PAPER NUMBER

2662

DATE MAILED: 06/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/200,523	MUJTABA, SYED AON	
	Examiner	Art Unit	
	AHMED ELALLAM	2662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-10,12-17 and 19-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-10,12-17 and 19-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This communication is responsive to Amendment filed on 11/24/2004.

Claims 1-3, 5-10, 12-17 and 19-21 are pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-3, 6-10, 13-17, 20, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alamouti et al, US (5,933,421) in view of Sjoberg et al, (Performance evaluation of the Zipper duplex method), IEEE 1998, pages 1035-1039 and further in view of Nakagawa et al, US (56,256,508).

Regarding claims 1, 8 and 15, with reference to figure 1, Alamouti discloses a wireless cellular communication system in which a plurality of remote stations (U, V) communicate with a base station Z, the base station receiving a first incoming wireless signal comprising a plurality of first discrete frequency tones that are orthogonal frequency division multiplexed (OFDM) in a first frequency band from a first remote station (U), and a second incoming wireless signal comprising a plurality of second

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discrete frequency tones that are orthogonal frequency division multiplexed (OFDM) in a the first frequency band from a second remote station (V), and that the first and second remote stations have different sets of discrete frequency tones. See column 5, lines 21-67. In addition, Alamouti discloses that the base station transmit a first wireless outgoing signal 18 comprising a plurality of third discrete frequency tones $F1$ that are orthogonal frequency division multiplexed (OFDM) in a second frequency band to the first remote station (U), and that the first remote station and base station use different sets of discrete frequency tones ($F2$, $F1$), see column 9, lines 66-67 and column 10, lines 1-13. Alamouti further discloses that the total signal frequency band is divided into N frequency orthogonal sub-channels, see column 3, lines 7-24, and that the total bandwidth of the airlink (uplink and downlink) is divided into a lower band and upper band. See column 13, lines 9-20.

Alamouti does not disclose assigning to one of uplink and down link a k carriers in a set of M OFDM carriers in a given frequency band, and assigning to the other of the uplink and down link the remaining $M-k$ carriers in the set of M carriers, wherein adaptive duplexing between uplink and down link is achievable by varying the value of k .

However, Sjoberg discloses a Zipper Duplex in which different DMT sub-carriers (Discrete Multi-tone carriers are allocated dynamically for the upstream and downstream, and that the number of upstream sub-carrier and the number of downstream sub-carriers are complimentary to each other (claimed k and $M-k$ sub-

carriers), the Zipper transmits and receives simultaneously. See pages 1035-1036, paragraphe II.

Therefore, it would have been obvious to an ordinary person of skill in the art at the time the invention was made to enable the OFDM allocation of Alamouti with the teaching of dynamic upstream and downstream DMT-subcarrier allocation of Sjoberg so that adaptive bandwidth allocation can be provided.

Alamouti in view Sjoberg do not disclose that communications between the base station and a subset of the plurality of subscribers units are separated from one another using one or more sector-specific spreading codes, wherein the sector-specific codes being associated with a corresponding sector of an antenna of the base station.

However, Nakagawa discloses separating communications between users and a broadcast station using sector-specific spreading codes, each associated with a corresponding sector of an antenna of the broadcast station (base station), see figure 9, column 9, lines 65-69, and column 10, lines 1-14.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to implement the sectorizing method taught by Nakagawa in the system of Alamouti in view of Sjoberg by recognizing the advantage in interference reduction from the teaching of Nakagawa. (Nakagawa, column 11, lines 30-40). The advantage of implementing Nakagawa's sectorizing in the system of Alamouti in view of Sjoberg would be the ability of the base station to simultaneously broadcast sector-specific data with minimum interference.

Regarding claims 2, 9 and 16, Alamouti discloses that the wireless unit can be fixed. See column 8, lines 20-28.

Regarding claims 3, 10 and 17, Alamouti discloses that the first and second wireless signals from the remote units (U, V) to the base station Z, and the third wireless signal from the base station Z to the first remote unit (U) are transmitted in different TDMA intervals, see column 9, lines 19-67, and column 10, lines 1-13. (Corresponding to using Time Division Multiple Access for separating communication between a subset of the subscriber units).

Regarding claims 6, 13 and 20, with reference to figure 1.7, Alamouti discloses an inverse Fourier transform operation at the base station.

Regarding claims 7, 14 and 21, with reference to figure 1.10, Alamouti discloses a Fourier transform operation at base station receiver system to recover multiplexed orthogonal frequency division multiplexed carrier.

2. Claims 5, 12, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alamouti in view of Sjoberg and further in view of Nakagawa as applied to respective claims 1, 8 and 15 above, and further in view of Frodigh et al, US (5,726,978).

Regarding claims 5, 12, 19, Alamouti in view of Sjoberg and further of Nakagawa discloses substantially all the limitations of parent claims 1, 8 and 15, except it doesn't explicitly disclose that the number of carriers in uplink and downlink sets varies across the time slots in accordance with uplink and down link demand.

However, Frodigh, with reference to figures 2 and 7, discloses an adaptive channel allocation method in an OFDMA system in which each up/down link capacities between a mobile and a base station are allocated based on bandwidth requests. See column 7, lines 39-50 and column 13, lines 23-46.

Therefore, it would have been obvious to an ordinary person of skill in the art at the time the invention was made to provide Frodigh' s adaptive channel allocation (OFDM allocations) with the OFDMA/timeslots allocation of Alamouti in view of Sjoberg and further in view of Nakagawa so to increase the capacity of the system.

Response to Arguments

3. Applicant's arguments with respect to claims 1, 8, and 15 have been considered but are moot in view of the new ground(s) of rejection.

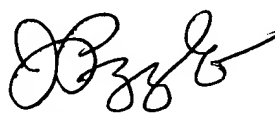
Any inquiry concerning this communication or earlier communications from the examiner should be directed to AHMED ELALLAM whose telephone number is (571) 272-3097. The examiner can normally be reached on 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kizou Hassan can be reached on (571) 272-3088. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AHMED ELALLAM
Examiner
Art Unit 2662
Tuesday, May 24, 2005



JOHN PEZZLO
PRIMARY EXAMINER